DEFENSE LOGISTICS AGENCY

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CURRENT AWARENESS BIBLIOGRAPHY (CAB) ON DISKETTE

SYSTEM / SUBSYSTEM SPECIFICATION (FINAL)

29 JANUARY 1991

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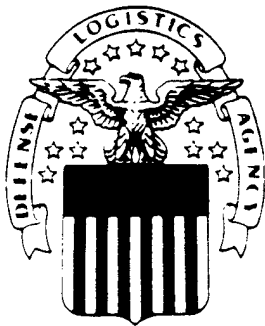SYSTEM / SUBSYSTEM SPECIFICATION (FINAL)

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CAB on Diskette System Specification - 01/29/91

SECTION 1 GENERAL

This section discusses the scope and purpose of this document, contains an overview of the Current Awareness Bibliography (CAB) on Diskette system, provides a brief summary of the references applicable to the history and development of the system, and lists the terms and abbreviations used throughout the document.

1.1 Scope

The CAB on Diskette System Specification (SS) document addresses the functional and technical issues related to development of the Current Awareness Bibliography (CAB) on Diskette Prototype system. This SS is intended for use by technical personnel in developing the CAB on Diskette prototype.

The SS defines the segmentation of the system, the rationale behind the segmentation, and sets in place a methodology from which coding and implementation of the system prototype can be achieved.

1.2 Identification

This System Specification document specifies the capabilities of the DTIC sponsored CAB on Diskette system as directed in Contract No. 90-A-0022-002, Task Order 12-1.

The System Specification is divided into four major sections:

a.   General. This section provides basic information about the CAB on Diskette system including scope, background information, the purpose of the system, and it's intended use.

b.   System Specification. This section contains the definition of the system, the system segmentation, the allocation of software functional requirements to the appropriate segment, the high-level design for each functional capability, and a definition of the inter-segment and intra-segment interfaces.

c.   The CAB on Diskette System Environment. This section discusses minimum hardware and software requirements for the CAB development and production environments.

d.   Appendices. The Appendices provide supporting documentation for the development of the prototype and further explain the design decisions reflected in this SS.

1.3 Purpose

The purpose of this document is to define a high-level specification for the CAB on diskette system. This document is derived from the system functional requirements as specified in the CAB on Diskette (CAB) Functional Description (FD), DTIC/TR-88/11.

The contents of this System Specification supersede the previous System Specification, DTIC/TR-89/3, which required revision based on the need to upgrade hardware and software components to accommodate the Windows 3.0 operating environment.

Upon DTIC approval, the System Specification will serve as the baseline document for the development of the CAB on Diskette prototype. The System Specification is a technical document prepared for ADP personnel and assumes, at minimum, a familiarity with programming in a windows environment.

The System Specification defines the system segments, allocates component modules to the appropriate segments, and provides high-level descriptions of functions that need to be developed. The SS also identifies required modifications to the Mainframe segment functions that are resident on the UNISYS 2200 series computers. These functions extract and format CAB data for distribution in hardcopy form or for distribution on diskette.

1.4 Overview

The CAB on Diskette program, initiated by DTIC in May 1988, will provide CAB users with a software product for accumulating and distributing Current Awareness Bibliography information. ZyLAB Inc., the developer of the ZyINDEX package, was selected as the vendor to support the CAB on Diskette effort. During system development, ZyLAB decided to convert their product from an application running in a DOS environment to one that runs in a Windows 3.0 environment. ZyLAB's decision was in response to evolving industry standards concerning user interfaces and emerging trends towards desktop technology. However, this decision by ZyLAB forced DTIC to re-evaluate and subsequently redirect the CAB on Diskette project.

To ensure a common user interface and a consistent set of bibliographic tools, DTIC decided to redirect the CAB software development effort to present the system as a Windows 3.0 application. This redirection has a significant impact on resource allocations since the Windows 3.0 environment requires a more powerful and sophisticated hardware platform than is currently

supported by the majority of the user community (as indicated by the user survey of July, 1988).

To determine the predominant system configuration within the user community and to develop a more complete understanding of the data management requirements as they relate to the capabilities of the existing CAB software, DTIC requested that the functional requirements derived from the 1988 survey be validated with respect to current CAB user requirements. To facilitate the validation process, DTIC sponsored an informal survey involving a cross section of CAB users. The questionnaire and the associated responses are presented in Appendix A.

Finally, DTIC requested that the System Specification be revised to incorporate additional hardware/software requirements as well as additional capabilities derived from the informal survey.

1.5 Project References

The following documents have been used in the development of the System Specification:

a.   Current Awareness Bibliography (CAB) on Diskette Functional Description, DAITC/TR-88/002, 19 August 1988.

b.   Current Awareness Bibliography (CAB) System Specification, DAITC/TR-88/008, 5 December 1988.

c.   Current Awareness Bibliography (CAB) User Needs Assessment (the survey questionnaire), June, 1988.

d.   Current Awareness Bibliography User Needs Assessment Summary, August, 1988.

e.   Current Awareness Bibliography (CAB) Software Recommendation Report, 1988.

f.   ZyLAB product documentation for the COTS product, ZyLAB Plus, 1988.

g.   Microsoft Windows Software Development Kit (SDK) Version 3.0, Programmers Guide, 1990.

h.   Extensible Virtual Toolkit (XVT) Microsoft Windows 3.0 version Programmers Manual, January, 1990.

i.   Systems Application Architecture, Common User Access, Advanced Interface Design Guide, published by IBM, 1988.

j.   Replicated Images, RIMAGE, Reference Manual, Flexible Diskette Format Kopy System, May 1988.

k.   Current Awareness Bibliography (CAB) on Diskette Requirements Validation (Draft), 20 November 1990.

1.6 Terms and Abbreviations

The terms and abbreviations used throughout discussions in this document are listed below.

Term	Definition
AD	Accession Document
ADD	Automatic Document Distribution
ADN	Accession Document Number
APP	Applications Portability Profile
ASCII	American Standard Code for Information Interchange
ATN	Automated Technical Abstract Bulletin Notice
ADD Program	An automated service for establishing profiles describing subjects of interest for bi-weekly distribution on microfiche of newly accessioned documents
CAB	Current Awareness Bibliography
CD-ROM	Compact Disk Read Only Memory
CHI	UNISYS terminal emulation and file transfer software
COTS	Commercial Off-The-Shelf product
DA	Distribution Availability
DAITC	The Defense Applied Information Technology Center
DBMS	DataBase Management System
DGIS	Department of Defense Gateway Information System
Diskette	A 5 1/4 inch magnetic storage medium which will be used to distribute CAB data electronically

DoD   Department of Defense

DROLS   .   Defense Research, Development, Test and
                Evaluation Online System

DTIC   Defense Technical Information Center

DTIC-B   DTIC Office of User Services and Marketing

DTIC-EA   Information Research and Technology
      Division of the DTIC Office of Information
Systems and Technology

DTIC-F   DTIC Directorate of Document Services

DTIC-HAR   DTIC Retrieval Analysis Branch of the
                Analysis Division of the Directorate of
                      Database Services

DTIC-Z   DTIC Directorate of Telecommunications and
                Information systems

LION   Library of Input/Output Numerical Conversion
                Routines for the UNISYS 2200 series computers

NIST   National Institute of Standards and
                      Technology

PC   Personal Computer

Profile   The search strategy used to extract
                      bibliographic abstracts.

Prototype   An implementation of an information system
                designed to prove feasibility, not intended
                to be the final production system

RAM   Random Access Memory

RTIS   Remote Terminal Input System

SAA/CUA/AIDG   Systems Application Architecture/
                Common User Access/
                Advanced Interface Design Guide

SC   Security Classification

SS   System Specification

TAB   Technical Abstract Bulletin

TR   Technical Report

XVT   Extensible Virtual Toolkit

SECTION 2   SYSTEM REQUIREMENTS

This section defines the CAB on Diskette System/Subsystem characteristics and requirements. This section establishes the relationship between the functional requirements, as stated in the CAB on Diskette FD, and the system design intended to satisfy those requirements.

2.1 Software Requirements

The Current Awareness Bibliography (CAB) service was developed by DTIC in response to the difficulty researchers have remaining current with the diverse and highly specialized areas of research sponsored by the Department of Defense (DoD). CAB users, in conjunction with a DTIC information specialist, develop a profile which defines the users area or areas of interest. These profiles are then used as input to the DTIC mainframe computer to extract bibliographic abstracts of relevant technical reports received during the previous 2 week cycle. Currently, hardcopy versions of the bibliographic abstracts are mailed to the user.

The CAB on Diskette product is a single user system designed to provide users the ability to store and further utilize electronic versions of CAB data as a substitute for or a supplement to the current hardcopy versions. When implemented, the CAB on Diskette system will distribute Current Awareness Bibliographies on diskette to those users who wish to receive the CAB data on electronic medium.

Beyond the distribution of CAB data on diskette, the system will include the capabilities as described in the CAB on Diskette Functional Description document and derived from the results of the user survey (see Appendix A). The CAB on Diskette product will include the capability:

a.   for subscribers receiving Current Awareness Bibliographies on diskette to create a CAB database for subsequent manipulation on a microcomputer system.

b.   to append bi-weekly releases of CAB on Diskette data to the CAB database.

c.   to search and retrieve documents enabling users to accumulate CAB's, further refine search strategies, create ad hoc reports, include CAB references within other documents and track DoD funded research in selected areas.

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d. to unpack data from the diskette into a standard CAB format prior to loading it into the CAB database.

e. to utilize CAB data with software packages not directly supported by the CAB on Diskette system.

f. to utilize the CAB database as a cumulative index to Automatic Document Distribution (ADD) microfiche reports received through participation in the ADD program using the same profile topic or topics as provided with CAB.

g. to update a CAB database based on the quarterly distribution of "Notice of Changes Distribution and Availability" (ATNs) on diskette. The capability will automatically update the user's CAB database with information in the ATN update release.

h. to access additional online services, download related bibliographic information to a users PC and incorporate the information in the cumulative database.

i   to convert data downloaded from additional online sources into a CAB compatible format.

j. to order technical reports online.

k. to modify CAB user profiles online and forward the modification to DTIC.

l. to browse the current release of CAB data prior to loading the information into the CAB database. The browsing capability will screen the biweekly set of citations and allow the user to indicate that: a citation is to be deleted from the current collection; an order is to be generated for the associated Technical Report; or the citation is to be loaded into the CAB database.

m. to provide an online context sensitive help capability that retains the characteristics and behavior of help utilities for existing Windows 3.0 applications and adheres to the standards for developing help facilities for Windows 3.0.

n. to prevent the inclusion of duplicate bibliographic citations into a user's database.

o. to compare the amount of available hard disk space to the volume of data represented by the current diskette of CAB data and prevent loading of the data to the cumulative database if there is not sufficient disk space.

p.   to archive selected partitions of the CAB database to either diskette or tape.

q.   to upload data to an optical drive.

2.2 System Segmentation

In support of the above stated functional requirements the CAB on Diskette system will be segmented into three subsystems. The three subsystems are:

a.   The Mainframe Subsystem;

b.   The CAB Toolset Subsystem;

c.   The CAB COTS Product Subsystem. This subsystem is comprised of the following products; the Operating Environment (Windows 3.0 by Microsoft), the indexing, search and retrieval subsystem, (ZyINDEX by ZyLAB) and the RIMAGE Diskette Duplication System.

Each of the three subsystems provides services in fulfilling system requirements. The rationale for dividing the CAB on Diskette system into three segments is to ensure system maintainability during the development and production phases of the software life cycle.

Further, two of the three segments of the CAB on Diskette system (Mainframe and CAB Toolset) reside on different hardware platforms and utilize vastly different software components (operating systems, programming languages, user interfaces). The third segment, which consists of the COTS products Windows 3.0, the Operating Environment, ZyINDEX which provides the text search and retrieval components and the RIMAGE Diskette Duplicating System are commercial packages enhanced by developers in response to market requirements. The impact of future enhancements and/or modifications will be mitigated substantially by segmenting the system in the manner described.

The reasons for segmenting the CAB on Diskette system into three subsystems are as follows:

a.   The subsystems reside on different hardware platforms.

b.   There are no direct inter-process dependencies among the three subsystems. The fact that one subsystem becomes inoperable, does not preclude the other subsystems from providing their allocated capabilities.

c.   The programming languages and software development tools are substantially different among subsystems.

d.   The Mainframe subsystem is maintained and operated by DTIC, the CAB Toolset subsystem is distributed and installed on personal computers, the CAB COTS Product subsystem is a collection of COTS products (Windows 3.0, ZyINDEX and the RIMAGE system) over which DTIC has no direct control.

e.   Security issues currently apply to only one subsystem, the Mainframe subsystem.

f.   As long as modifications to a subsystem do not alter the output which serves as input to another subsystem, software maintenance can be isolated to a subsystem. For example, a modification applied to the mainframe subsystem, will not necessarily result in changes to the user interface subsystem.

g.   The segmentation will facilitate development, testing and quality assurance activities by clearly delineating interface criteria between and among subsystems.

The following paragraphs briefly describe system capabilities by segment. The capabilities will be discussed in detail in Section 2.4 of this document.

2.2.1   Mainframe Subsystem Capabilities

The Mainframe subsystem is comprised of those modules responsible for satisfying the following software requirements:

a.   extracting, formatting and writing the CAB data to tape for eventual use on diskette.

b.   processing requests for technical reports.

c.   applying modifications to CAB user profiles.

d.   providing an interface to the Rimage system.

The current CAB system software configuration extracts and formats bibliographic data from the TR database for distribution on hardcopy format. There are a number of modules contributing to the production of the hardcopy CAB product that will continue to support the CAB on Diskette system. Those modules that are responsible for maintaining CAB profiles, extracting CAB data by search control number (SCN), and sorting the extracted CAB data will remain unchanged. The module, CCA40R, is responsible for

writing CAB data to a mass storage device. This module will be modified to direct the system to create a tape of CAB on Diskette data to be used as input to the RIMAGE Diskette Duplicating System.

There are three modules in development that further modify CAB data in preparation for input to the RIMAGE system. These modules are EDD26X, EDD31C and EDD32P. The requirements of these modules are specified in section 2.4.1.

2.2.2   CAB Toolset Subsystem Capabilities.

This subsystem is comprised of those modules responsible for satisfying the following software requirements:

a.   creating the CAB database.

b.   appending bi-weekly releases of CAB data to the CAB database.

c.   managing system resources on the user's PC.

d.   converting downloaded data from additional online services accessible through the DGIS into a CAB compatible format.

e   browsing the current release of CAB data.

f.   providing archival services.

g.   generating online requests for technical reports.

h.   modifying CAB user profiles online.

The modules that comprise the CAB Toolset subsystem are developmental items. Some of the modules were developed prior to the decision to implement the CAB on Diskette product as a Windows 3.0 application. These modules will be re-evaluated to determine whether they are still viable within the Windows 3.0 Operating Environment. Other modules which will be incorporated into the subsystem have yet to be developed. The requirements of these modules are discussed in section 2.4.2.

2.2.3   **The CAB COTS Product Subsystem** (the Operating Environment, the Indexing and Text Search Subsystem Capabilities and the RIMAGE Diskette Duplicating System).

The CAB COTS Products subsystem is comprised of those components responsible for satisfying the following software requirements:

a.   Provide a consistent user interface for all CAB on Diskette applications. (Windows 3.0 Operating Environment)

b.   Provide a text indexing, search and retrieval capability for utilizing CAB on Diskette data. (ZyINDEX)

c.   Provide a system for duplicating diskettes for distribution to CAB subscribers. (RIMAGE Diskette Duplication System)

The Operating Environment is Windows 3.0, developed and supported by Microsoft. Windows 3.0 is a graphical user interface (GUI) which runs over the DOS operating system. It provides a consistent means for the user to interact with applications supported by the GUI. The interface is presented using what is commonly referred to as a desktop metaphor. The system presents applications as a representative icon such as file folders, file cabinets, documents, printers, etc., that aid the user in traversing directories or requesting system services such as printing or storing a file. Input to the system and the supported applications is provided either with a mouse, a keyboard or a combination of the two devices.

ZyINDEX provides the indexing, text search and retrieval capabilities. ZyINDEX possesses a sophisticated indexing scheme as well as a powerful and highly flexible search engine. ZyINDEX responds to the capabilities requested of a text retrieval system as enumerated in the user survey conducted in March of 1988.

In addition, ZyINDEX provides a toolkit for customizing the interaction between ZyINDEX and other CAB on Diskette system components. With the ZyINDEX Toolkit, required document management capabilities, (e.g. addressing individual citations, updating citations based on a quarterly release of ATN data and performing duplicate elimination) which are not part of the standard ZyINDEX product can be developed using the core functionality of the ZyINDEX product.

The RIMAGE Diskette Duplication System is developed and distributed by RIMAGE Corp. CAB data will be transferred from tape to a high capacity Winchester disk drive as flat ASCII files. The RIMAGE

system is responsible for duplicating, inserting the diskettes into sleeves and labeling the diskettes.

The ability of the RIMAGE system to duplicate diskettes is dependent on the integrity of the data extracted from the UNISYS 2204/402. The RIMAGE system is integral to the ability of the Mainframe subsystem to produce CAB data on diskettes, however, it is a COTS product which DTIC has no ability to modify. Therefore, an understanding of the interface between the RIMAGE component and other Mainframe subsystem components is essential in providing CAB data on diskette.

2.3 Applicable Standards

The CAB Toolset Subsystem and ZyINDEX will be developed in adherence to the standards for development of a user interface as expressed in the Systems Application Architecture (SAA), Common User Access (CUA), Advanced Interface Design Guide (AIDG). This document is frequently used as the standard for systems developed within a Windows 3.0 environment. The Windows 3.0 Operating Environment was itself developed in accordance with these standards.

The development of this document was performed using structured analysis and design techniques (e.g. Gane Sarson or Yourdon DeMarco), as will subsequent design or development activities. The utilization of these software development techniques greatly enhance the ability of the developer to create or modify component modules of the CAB system by modularizing system capabilities into manageable blocks of code. The value of these techniques are well understood throughout the software industry and are particularly useful to systems development after prototyping activities in the definition and design phase have stabilized the system under development.

2.4 CAB on Diskette System/Subsystem Design

The CAB on Diskette system is comprised of three subsystems. Each subsystem is a separately configurable area of functionality that collectively supports the requirements established in the FD for the CAB on Diskette system.

The three areas of functionality participate equally in the development and presentation of data for use by CAB on Diskette system users. The Mainframe subsystem provides the capabilities necessary for the extraction and formatting of CAB data for distribution on diskette.

The CAB Toolset subsystem provides a collection of applications that prepare and enhance CAB data for indexing and subsequent retrieval. The CAB Toolset subsystem also provides pre/post-processing functions relevant to the use of CAB data.

The Windows 3.0 Operating Environment, the ZyINDEX product and the RIMAGE Diskette Duplicating system comprise the CAB COTS Products subsystem of the CAB on Diskette system.

2.4.1 Mainframe Subsystem Functions

The modules under development within DTIC for extracting and formatting CAB data are two (2) UNISYS assembler modules and one UNISYS COBOL module. The assembler modules EDD26X and EDD31C, are responsible for formatting the data and preparing a tape for input to the COBOL module. The COBOL module EDD32P is responsible for controlling input to the RIMAGE system for mass-production of diskettes. Refer to Appendix B for a diagram that depicts the flow of CAB data through this subsystem.

The modules EDD26X and EDD31C partially satisfy the allocated requirements. Further modifications, however, should be applied to these modules to facilitate production and distribution of CAB data. The proper allocation and implementation of modules within this subsystem are critical to the success of the CAB on Diskette system.

Specifically, modifications will be applied to modules within this subsystem to support the following:

a. to identify fields within individual citations in the same manner as provided in the current hardcopy output of CAB such that online display of the CAB data emulates the printed product;

b. to provide an end of citation identifier to appear after each citation; and

c. to enhance the header information to include the following information: search control number, diskette creation date, number of citations included on the diskette (reflects the number of citations extracted per profile), file size (represents the total number of bytes of CAB data on the diskette).

The following modifications will be applied to module EDD31C:

a.   Modify the profile header record to indicate that the CAB data is to be written to diskette. The modification consists of adding a one byte flag indicating whether the data associated with a particular profile is to be written to diskette, prepared for hard copy output, or prepared for both mediums. The flag should have one of three possible values (0, 1, 2). A zero (0) indicates that the data is to be prepared for hardcopy output only. A one (1) indicates that the data is to be prepared for output to diskette only. A two (2) indicates that data is to be prepared for output to both media.

The following modifications will be applied to the module EDD26X:

a.   Substitute the output of numeric field identifiers that identify fields within a CAB citation with the field names that appear on the hardcopy product. These fields must be delineated from the actual text. Each field identifier will be enclosed within angle brackets (<field identifier>).

b.   At the end of each CAB citation, supply an end of citation identifier. The end of citation identifier will consist of a label enclosed within angle brackets, followed by three blank spaces, (e.g. <EO_citation--->). The requirement for the end of citation identifier will be explained in section 2.1.2.2, CAB Toolset Subsystem Design Details.

c.   Initiate and increment a counter for each profile. The counter represents the number of CAB citations written to diskette for a particular profile. The count will be incorporated into the header information for each profile written to diskette. The requirement for this field is explained in section 2.1.2.2, CAB Toolset Subsystem Design Details.

d.   Initiate and increment a counter representing the number of bytes of CAB data, excluding the header information. The count will be incorporated as part of the header information for each profile written to diskette. The requirement for this field is explained in section 2.1.2.2, CAB Toolset Subsystem Design Details.

Additionally, the COBOL module EDD32P, which provides the interface to the RIMAGE, should be modified to reflect the changes that were applied the EDD26X and EDD31C modules.

Modifications to the existing ATN subsystem should be applied to include the following capabilities:

a. Initiate and increment a counter that accumulates the number of citations issued in the quarterly update. Include the count in the header record;

b. Eliminate those fields in the ATN that are not part of the CAB on Diskette data while ATN data is prepared for output to diskette;

c. Initiate a counter that tracks the number of profiles processed in order to determine the number of ATN diskettes to produce.

2.4.2   CAB Toolset Subsystem Functions

The discussion of this subsystem is divided into two sections. The first section discusses those capabilities delivered with the prototype release of the CAB on Diskette product. The second section discusses those capabilities planned for the initial release of the CAB on Diskette product.

A phased development approach for the CAB on Diskette system was adopted partially to satisfy project milestones which were negatively affected when ZyLAB opted to develop a Windows 3.0 version of their product. This decision required redevelopment of prior DTIC sponsored modules which were not compatible with Windows 3.0 and the new version of ZyINDEX.

2.4.2.1   Prototype Components

The following paragraphs discuss the functions scheduled for inclusion in the CAB on Diskette prototype. The protoype will include the capability to:

a. create the initial CAB on Diskette Database;

b. append the bi-weekly release of CAB data on diskette;

c. convert information from the DGIS standard format to a CAB compatible format;

d. update the CAB database based on the quarterly release of ATN data;

e. provide an online context sensitive help facility;

f.   unpack CAB data on the diskette, and

g   access additional online services.

2.4.2.1.1 Create Initial CAB on Diskette Database

The prototype release of the CAB on Diskette product provides the user with the ability to create the initial CAB database. This capability will be provided by the COTS product ZyINDEX (refer to Section 2.4.3).

2.4.2.1.2 Append Bi-Weekly Release of CAB Data on Diskette

The prototype release of the CAB on Diskette product provides the user with the ability to append a bi-weekly cycle of CAB data on diskette to the existing CAB database. This capability will be provided by the COTS product ZyINDEX (refer to Section 2.4.3).

2.4.2.1.3 Conversion from DGIS Standard Format to CAB Compatible Format

The prototype release of the CAB on Diskette product provides CAB users with the ability to access additional online services through the DoD Gateway Information System (DGIS).

Once connected to the DGIS, the user utilizes appropriate search techniques to access the desired information. Existing DGIS capabilities include a facility to convert data retrieved from the online service to a standard DGIS format. This component will be accessed to convert the data from standard DGIS format to a CAB compatible format.

CAB data distributed on diskette will be fielded to emulate the printed product. This module ensures that the bibliographic citations downloaded from the DGIS online source are identically structured to the data stored in the CAB database. During the conversion process, those fields not present in the downloaded citation that are required by CAB citations, will be set to blanks.

The conversion process does not apply to the text or content of the data. The conversion applies only to substituting CAB compatible field identifiers (see Appendix C) for those field identifiers supplied by the particular online service. Once converted, the data can be appended to the user's CAB database, indexed and searched using the ZyINDEX search capabilities.

During the prototype development phase of the CAB on Diskette project, the conversion requirements for selected online services

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will be specified. The requirements will be expressed in conversion tables which will be developed and maintained separately from the actual processing module.

The code that performs the conversion will be developed in one program. There will not be a conversion module for each online service. Service specific conversion requirements will be stored as a series of from - to arguments which will be passed as parameters to the conversion program at run time. Using this approach will require no modifications to the conversion program as services are added or removed from the system.

Initially, conversions will be provided only for those online services supported by the DGIS. Additional online services can be added, and conversion tables developed, for inclusion in the CAB on Diskette system.

2.4.2.1.4 ATN Update of CAB Database Capability

This module provides the capability to update a CAB database based on the quarterly distribution of ATN changes. The changes will be distributed on diskette.

The ATN system, an adjunct to the CAB on Diskette system, tracks changes in distribution availability (DA) codes and security classification (SC) of accessioned technical reports. Changes in security classification and distribution limitation statements occur due to periodic downgrades in the security classification, errors in the original classification or by the proponents' request that the technical report be reclassified.

Classification changes are applied via the Remote Terminal Input System (RTIS), a component of the Mainframe subsystem. A request is made to the TR Database for the current classification and distribution information for each Accession Document Number (ADN). The information is compared to the classification notice change and the ADN is corrected to reflect the reclassification.

On a quarterly cycle, Automated Technical Abstract Bulletins (TAB) Notice ATN information is extracted, formatted, written to tape and printed for verification. The process is initiated as either a quarterly cycle or as an annual report. The process updates the ATN master file, produces a hardcopy list of ATN records, a tape containing Automated TAB Notices and generates a printout of the Notices of Changes in Classification, Distribution and Availability. Distributing ATN information on diskette will require modifications to the ATN component of the Mainframe subsystem.

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The ATN Update of CAB Database module will update only those CAB citations for which a corresponding match in the ATN update file exists. Those ATNs that do not have a corresponding match in the users CAB database will be discarded.

2.4.2.1.5 Online Context Sensitive Help Capabilities

The online Context Sensitive Help capability will be developed using the Windows 3.0 Software Development Kit (SDK). The Help development tool provides the system developer with the ability to provide CAB users with CAB specific help that is presented, accessed and utilized in the same manner as help facilities developed for any Windows 3.0 application. This eliminates from the user the burden of learning another help system. The commonality of presentation within the Windows environment ensures that the CAB on Diskette help system will be readily accessible to the user.

The process of developing a Windows compatible help system is a complex process. Help systems are constructed by selecting topics and establishing relationships among them using hypertext links. The development of the help system requires two independent and parallel efforts. Existing CAB related help information will need to be re-keyed or loaded from other text, if available, into what is termed a Rich Text Format (RTF) editor such as Microsoft Word for Windows, version 1.0. Prior to re-keying the text, a substantial effort will be required to structure the help text for input into the help system development tool.

The process of structuring the help text requires that text related to the selected help topics be defined. Once defined, the appropriate control codes for establishing the context sensitive relations, hypertext link, or mapping of a keyword to a definition or series of steps must be entered. These control codes dictate how the CAB user moves among help topics.

The CAB on Diskette System requires programming in order to access the help system. This is accomplished by associating an application, function, or activity with the relevant section(s) of help information.

The CAB on Diskette help capability will provide two levels of help:

a. Help specific to manipulating the system menus, options, and devices used to navigate through the system.

b.   Help pertinent to the CAB application. For example, should a
     user require help in accessing the DGIS, it could be done in
     one of two ways. The user may select the help option from the
     CAB main menu bar. The help option would provide the user
     with a list of topics to browse. The communications topic
     could then be selected and the appropriate help text would be
     displayed.   The   second   method   entails   selecting   the
     communications option from the CAB main menu bar. Once within
     the communications application, the user may select the help
     option. The system would respond by displaying the list of
     topics and text relevant to the communications application.

For the help facility to provide the level of support discussed
above, DTIC will be required to provide substantial guidance in
defining the levels of support required by CAB users (e.g.novice,
expert). There are no specific rules for determining the content
of a help system. It will be incumbent upon DTIC personnel or
appointed representatives to document the commands, features,
procedures and capabilities that will constitute the help facility.
The definition of the help system must be completed prior to
initiating the task of programming the help system.

2.4.2.1.6 Unpack CAB on Diskette Data

This capability is required to facilitate the display of CAB data
on the users terminal in a manner that emulates the printed
product. This capability also facilitates loading CAB data from a
diskette into the CAB database.

Current DTIC procedures extract CAB data from the TR Database. The
data is packed as it is written to tape prior to being transferred
to diskette. Currently, DTIC procedures for packing data do not
include tokenizing repeated characters. Data packing is limited to
eliminating trailing whitespace (blanks and tabs for example) from
individual citation fields.

CAB data is fielded using pre-defined field identifiers (see
Appendix C). The Unpack CAB on Diskette Data module will parse the
CAB input file on the diskette. Parsing requires the module to
isolate fields within the text stream by determining the end of a
field.   The occurrence of a new field identifier support this
capability. At each occurrence of a new field identifier, the
module will insert a carriage return line feed character and write
the field to an output file. This procedure results in each field
within a citation being written as a separate record. Fields
spanning several lines will be output as a series of seventy (70)
character lines with appropriate word-break constraints applied.
This provides the flexibility to present the data in a variety of

formats on both the system monitor and on a hardcopy representation.

2.4.2.1.7 Access to Additional Online Services Capabilities

This function provides the capability for a user to access additional online services using a COTS communications package. The communications package will support terminal emulation and file transfer capabilities.

It is recommended that this capability be satisfied using a communications package which is compatible with the Windows 3.0 product. These packages have already been adapted to the Windows environment and are consistent with the look and feel of other CAB on Diskette system components.

2.4.2.2   Initial Release Components

The following paragraphs discuss the functions scheduled for inclusion in the initial release of the CAB on Diskette product. The initial release will include:

a.   a system browsing capability;

b.   a capability to modify a user profile online;

c.   a capability to order technical reports online;

d.   a database monitoring capability, and

e.   a database archiving capability.

2.4.2.2.1 CAB on Diskette System Browse Capability

The CAB on Diskette system browse capability will be developed as a Windows 3.0 application using the Windows 3.0 SDK and the ZyINDEX Toolkit. This application will provide the user with a means for reviewing unpacked CAB data prior to storing it in the CAB database.   The user will have the capability to browse the citations and request the tool to perform specific operations on the citations.   The user will indicate the desired operation by activating a push button.   A push button is a standard Windows feature, which when selected, initiates a pre-defined and coded operation.

The browsing tool consists of two sub-sets of operations; navigational and functional. The navigational operations allow the

user to maneuver within a file. The functional operations allows the user perform specific operations on CAB citations.

The navigational operations are:

a.   FILE - The selection of this operation will prompt for a file name and retrieve the specified file. If the file cannot be located, an appropriate error message will be displayed.

b.   NEXT - The selection of this operation will display the next citation in the file.

c.   PREVIOUS - The selection of this operation will retrieve the preceding citation in the file.

d.   CLOSE - The selection of this operation will close the file currently being browsed.

e.   EXIT - The selection of this operation will terminate the browsing session.

The functional operations are:

a.   INCLUDE - The selection of this operation indicates the current citation should be included in the CAB database.

b.   EXCLUDE - The selection of this operation indicates the current citation is not to be included as part of the CAB database.

c.   REPORT - The selection of this operation indicates that an online request for a technical report should be generated for the current citation.

Additional software development requirements for the UNISYS Assembler modules EDD26X and EDD31C and the UNISYS COBOL module EDD32P were specified in section 2.4.1 (see, also Appendix D). These additional modifications were required to support the browsing capability. The additional information written to the header record for each diskette, as well as the field identifiers and the end of CAB citation indicator will be used to manage browse function capabilities.

Specifically, the number of citations included in the header record information provides the browse capability with a means of navigating through a file by providing controls for the incremental access of citations.

The inclusion of an end of citation identifier provides two capabilities required by the browse tool. It provides an easy method of delimiting citations within a file, and it provides the capability to store the browse tools' post-processing indicators for executing the INCLUDE, EXCLUDE, or REPORT operation which may have been requested by a user.

The browse capability is specifically designed to support the CAB on Diskette system. As such, it will display citations and appropriate field identifiers for CAB citations. The tool is not intended as a full function browsing application.

2.4.2.2.2 Modify CAB Profile Capability

Currently, CAB user profiles are developed by the user in conjunction with a DTIC information specialist. The user conveys areas of interest to a specialist who converts the requests into appropriate search strategies for extracting technical information. Requests can be referred to DTIC in one of three ways:

a. A user can submit a DTIC Form 64, a request for database services.

b. An end user can relay a request to an intermediary, such as a librarian, who refers the request to a DTIC information specialist, via a telephone conversation.

c. A user can relay a request through the mail.

This component permits a DTIC user to express subjects of interest using an electronic representation of a DTIC Form 64. Upon completion and validation, the form will be forwarded to DTIC through the DGIS connection, supported by the CAB on Diskette system to the designated electronic mail box on the CARES system.

This E-Mail box will be periodically checked by a DTIC information specialist who can translate the content of the Form 64 into an appropriate search strategy.

2.4.2.2.3 Technical Report On-Line Ordering Capability

Current online users have the capability to forward online requests for technical reports to DTIC. Some users are connected to the Defense RDT&E Online System through the DGIS. These users access existing system capabilities to request technical reports. The CAB on Diskette system will utilize existing online ordering capabilities for accessing technical reports through the DGIS.

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This capability will be developed using the Microsoft Windows 3.0 SDK.

The online ordering capability will be presented to the user in two ways:

a.   The ordering capabilities may be accessed as part of the browsing capability. As discussed above, a user can instruct the system to generate a request for a technical report while reviewing the associated CAB abstract by pushing the button labeled REPORT.   This extracts the minimum required information from the citation, (accession number), prompts the user for additional information (DTIC user code, delivery medium, hard copy or microfiche, NTIS deposit account number) and generates a formatted request utilized by the RTIS system, and forwards the request through the DGIS to provide standard online processing.

These capabilities are provided by accessing existing commands that provide online request capability for those citations with a distribution designation of 'unlimited'. The command @TA@, followed by the accession number of the desired technical report(s) and terminated by the keyword END, is forwarded to DROLS retrieval system for further processing. This command requires that one accession number be generated per line. A second command, @OUF@, indicates the preferred delivery medium (hard copy, microfiche). Finally, the user supplies the system with the appropriate DTIC user code and NTIS deposit account number for subsequent billing.

For citations that have a distribution designation of 'limited', the CAB user will be presented with an electronic representation of a DTIC Form 55. The format of the Form 55 will be modeled off that which is currently used to order technical reports online through the DROLS system. Refer to the DROLS Handbook available at DTIC for the current screen design, required fields and required edit checks for ordering technical reports.

b.   The ordering capability may be accessed by selecting the REPORT option on the CAB on Diskette system main menu bar.

Upon selection, the user is presented with a list of technical reports displayed in a window. Using standard point and click techniques the user can select accession numbers from the list, or input them directly using the keyboard. The window prompts for DTIC user code, delivery medium and NTIS account

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number. Upon completion, an online request is generated and forwarded using existing commands.

2.4.2.2.4 Database Monitoring Capability

This capability is provided as a sub-function of the Append capability discussed in section 2.4.2.1.2. Prior to invoking the Append module, this module computes the available space on a user's hard disk or hard disk partition. The module compares the amount of remaining free space on the hard disk to the volume of data on the diskette. The volume of data on the diskette is recorded in the header information that is distributed with each diskette.

If the amount of remaining free space is insufficient to accommodate the data on diskette, the module generates an appropriate message and terminates the process. If the amount of free space is adequate, the module will invoke the Append module.

2.4.2.2.5 CAB Archival Service

The CAB on Diskette system will have the capability to archive all or selected parts of a CAB database. The module is accessed by selecting the ARCHIVE option on the CAB on Diskette system main menu bar.

The data contained within the CAB database is internally partitioned by the system based on the bi-weekly release date. Selected dates or a range of dates can be supplied by the user to indicate which data is to be archived.

The Archival Service is responsible for providing the following capabilities:

a.   Request that the user indicate the drive to which the selected CAB data is to be archived.

b.   Prompt the user for labeling information to identify CAB data that has been selected for off-loading.

c.   Allow for the necessity of multiple diskettes or tape cartridges being required to accommodate the volume of data archived.

The Archival Service will be developed as a Windows 3.0 application and coded using the Windows 3.0 SDK and the ZyINDEX Toolkit. The module will provide an interactive capability for users of the CAB on Diskette system to off-load selected cycles of CAB citations.

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2.4.3   ZyINDEX Text Indexing Search and Retrieval Capability Design Detail

The following is a brief discussion of the capabilities contained in the selected text indexing, search and retrieval component, ZyINDEX.

The current ZyINDEX product is a text indexing, search and retrieval tool that equates a file to a document. During the indexing process, content words and the location of each instance of words contained in the document are recorded. When a user formulates a search request and submits it to the search component of the ZyINDEX product, documents containing the word or combination of words are retrieved. The system positions the user in close proximity to those words. The user may then browse the retrieved documents.

Unlike some text search products, ZyINDEX does not provide document or data management capabilities. Nor does it update, modify or delete the users collection of documents.

ZyINDEX, however, does fulfill the following CAB on Diskette functional requirements by providing the capability to:

a.   allow subscribers receiving Current Awareness Bibliographies on diskette to create the initial CAB database.

b.   append bi-weekly releases of CAB on Diskette data to the CAB database.

c.   include a text indexing and retrieval component enabling users to accumulate CABS, further refine search strategies, create ad hoc reports, include CAB references within other documents and track DoD funded research in selected areas.

d.   utilize the CAB database as a cumulative index to Automatic Document Distribution (ADD) microfiche reports received through participation in the ADD program using the same profile topic or topics as provided with CAB.

e.   update the CAB database based on the quarterly distribution of "Notice of Changes Distribution and Availability" (ATNs) information on diskette. Software will be provided, using ZyINDEX capabilities, to automatically update citations in the users database based on the content of the ATN update release.

f.   prevent the inclusion of duplicate bibliographic citations
     into a user's database using ZyINDEX capabilities (e.g. the
     ZyINDEX toolkit).

For a complete description of ZyINDEX capabilities refer to the
product documentation.

2.4.4   The Windows 3.0 Operating Environment

The selected operating environment, Microsoft Windows 3.0, is a
graphical user interface (GUI) using the desktop metaphor as the
basis for the man-machine interface.   Windows 3.0 supports a
variety of applications that have been developed using the Systems
Application Architecture (SAA), Common User Access (CUA), Advanced
Interface Design Guide (AIDG). Adherence to this standard provides
the user with a consistent means of accessing system services and
various Windows applications in a consistent manner. This approach
substantially decreases the time required to learn various
applications. Input to the system is provided by either a mouse,
the keyboard or a combination of the two.

The Operating Environment component of the CAB on Diskette system
will provide the following functional requirements:

a.   The capability to access additional online services and
     download related bibliographic information to a CAB user's PC.
     This capability will be provided using the communications
     component packaged with the Windows 3.0 product.

b.   The capability to provide an online context sensitive help
     facility. The help capability will be integrated into the CAB
     on Diskette application such that the characteristics and
     behavior for the CAB on Diskette product is consistent with
     existing Windows 3.0 applications. The development of the
     help facility will employ Windows 3.0 tools specifically
     designed for the development of help facilities for
     applications running within the Windows 3.0 environment.

The operating environment component of the CAB on Diskette
system will partially satisfy the following functional
requirements:

a.   The capability to order technical reports online.

b.   The capability to modify user profiles and forward them to
     DTIC.

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For a complete description of Windows 3.0 capabilities, refer to the product documentation.

2.4.5   The RIMAGE Diskette Duplicating System

The RIMAGE system is a COTS product responsible for the duplication of CAB data to diskette, labeling the diskette, and inserting the diskette in a sleeve for delivery to CAB users. For a complete description of the RIMAGE Diskette Duplicating System, refer to the product documentation.

2.5 CAB on Diskette System Interfaces

This section of the CAB on Diskette system specification will define the interfaces that exist between the three segments (inter-segment interfaces) as well as interfaces that exist among components within a segment (intra-segment interfaces).

Typically, an interface is defined as a layer of software that permits different applications to communicate with each other such that aggregate capabilities can be shared among applications. The more complex the interface, the less flexible and more difficult it becomes to maintain the component applications. The level of complexity for a given interface increases substantially when applications run on different hardware platforms.

It was for these reasons that the CAB on Diskette system was segmented, as described above.

2.5.1   Inter-Segment Interfaces

Each segment accesses the CAB data and modifies it producing an output product for use by another segment. This implies that each segment is responsible for ensuring that the format of the data conforms to the input requirements of the segment with which it has an interface.

The Mainframe segment is responsible for providing an ASCII data file with a formatted header record on a 5 1/4 inch low density floppy diskette. This diskette is the input product to the CAB Toolset segment. As long as the Mainframe components continue to produce an ASCII formatted file, there will be no additional interface requirements occurring between the two segments. In the same manner, as long as the CAB Toolset segment is capable of reading and processing the ASCII formatted file, the interface between these two segments will not require modification. Therefore, modifications to one segment will not have an impact on

other segments as long as the output product from the modified segment remains unchanged.

It is certainly possible for an output product to deviate from it's initial specification. For instance header information produced in the Mainframe subsystem may change thus requiring a modification in the CAB Toolset subsystem. Should this happen, the impact on the segments involved will be better understood and subsequent modifications can be isolated more readily since only the portion of the software within the segment responsible for accessing the data will be affected.

2.5.2   Intra-Segment Interfaces.

This specification addresses the interfaces within the Mainframe and CAB Toolset segments. The operating environment (Windows 3.0) and the text search and retrieval component (ZyINDEX) establish an interface via the requirements for developing applications within a Windows 3.0 environment as described in the SAA/CUA/AIDG.

2.5.2.1   Mainframe Intra-Segment Interfaces

This section addresses interfaces within the Mainframe segment that result from CAB on Diskette system requirements.

The interfaces within the Mainframe segment exist in those modules responsible for the transference of CAB and ATN data from the UNISYS 2200/402 to a microcomputer which hosts the RIMAGE Diskette Duplication system. The CAB data will be transferred from the mainframe to the microcomputer using standard terminal emulation and file transfer capabilities resident on the microcomputer. The data transferred will be a stream of ASCII characters. The transfer of ATN data from the UNISYS 2200/402 to the RIMAGE system will be handled in the same manner.

It is important to understand that the issue of data integrity between the dissimilar hardware platforms is critical. A clearly understood output product (ASCII data) from the UNISYS 2200/402 mainframe must be provided to the user for use by the CAB Toolset segment.

2.5.2.2   CAB Toolset Intra-Segment Interfaces

The intra-segment interfaces for the CAB Toolset segment exist primarily in the exchange of messages between Windows applications. Applications developed using this software development tool, and in conformance with the standards set forth in the SAA/CUA/AIDG, will

already have established a consistent set of protocols by which inter-process messages are communicated.

For these reasons, this document recommends that all software components of the CAB on Diskette system be developed as Windows 3.0 applications. The actual content of the messages as well as the specific actions that are to be executed as a result, will be provided during the development of the prototype version of the CAB on Diskette system.

The ZyINDEX 4.0 Toolkit, which will be used to develop several CAB system components, is a new product scheduled for Beta testing in December 1990. DTIC is among those sites selected to participate in the Beta test.

The Toolkit is a collection of C language functions that developers can use to incorporate existing ZyINDEX capabilities into their own products. This is referred to as an Application Program Interface, or API. To the developer, an API is analogous to a programming language. The Toolkit supplies API's for the five major components of the ZyINDEX product.

The Toolkit was selected to help provide a degree of document management capabilities not available with the standard ZyINDEX product. Specifically, CAB on Diskette system requirements specify that a file be viewed as a collection of documents or, in this case, citations. The standard ZyINDEX product is unable to do this. With the Toolkit, however, CAB on Diskette system developers can provide this capability.

The Toolkit, an untested product, has been selected for building CAB software components. This being the case, there are significant issues regarding intra-segment interfaces. The issues relate to the complexity of the API in interacting with the Windows 3.0 Operating Environment and other CAB applications as well as the degree of difficulty in developing applications using the Toolkit. Prior to developing the prototype, DTIC will be required to evaluate the ZyINDEX Toolkit in order to specify the interface between CAB applications and ZyINDEX applications.

SECTION 3 CAB on Diskette System Environment

This section discusses the hardware/software configuration for both the development environment and the CAB on Diskette user system. Additionally this section discusses the issues of portability and flexibility associated with software development.

3.1 Required Software Development Tools

The tools required for development of the subsystems differ substantially among the segments. For this reason, the required software development tools will be presented on a segment basis.

3.1.1 Mainframe Subsystem Software Development Tools

The Mainframe subsystem will employ the software development tools currently utilized by the existing systems. The table below lists the functions and sub-functions that comprise the Mainframe subsystem in the first column and the software tools that will be used for modification and development in the second column.

Mainframe Subsystem Functions

Function/ Subfunction	Software Development Package
ATN Subsystem	UNISYS COBOL and Compiler
CAB Module EDD32PA	UNISYS COBOL and Compiler
CAB Module EDD26X	UNISYS Assembly Language and Assembler
CAB Module EDD31C	UNISYS Assembly Language and Assembler
CAB Profile Module	ED Macros, TR DBMS, DMS 1100 UNISYS Tape/Disk I/O Modules LION I/O Routines
Automatic Diskette Duplication software	RIMAGE System

3.1.2 CAB Toolset Subsystem Software Development Tools

In referring to the following table, unless otherwise noted, development of component modules will be accomplished using Windows 3.0 Software Development Kit (SDK), version 3.0 in conjunction with the Microsoft C Language Compiler , version 5.1. For those modules requiring development tools other than those noted above, the complete set of development tools is listed.

The table is divided into two sections. The first section addresses the software development tools required for developing

the capabilities to be included with the CAB on Diskette prototype release. The second section addresses the tools required for the development of planned modules to be included as part of the initial release of the CAB on Diskette product.

PROTOTYPE

Functions/Subfunctions	Software Development Package
Conversion DGIS Standard Format to CAB Format	Microsoft C Compiler (5.1), Microsoft Windows SDK (3.0), ZyLAB Toolkit (1.0)
ATN Update of CAB Database	Microsoft C Compiler (5.1), Microsoft Windows SDK (3.0), ZyLAB Toolkit (1.0)
Connection to Additional Online Services	Microsoft Windows (3.0)
Unpack CAB data on Diskette	Microsoft C Compiler (5.1)
Context Sensitive Help	Microsoft Windows SDK (3.0), RTF format Text editor

INITIAL RELEASE

Initial Release Functions/Subfunctions	Software Development Package
Browsing Capability	Microsoft C Compiler (5.1), Microsoft Windows SDK (3.0), ZyLAB Toolkit (1.0)
Modify User Profile Online	Microsoft Windows SDK (3.0), Microsoft C Compiler (5.1)
Order Technical Reports Online	Microsoft C Compiler (5.1), Microsoft Windows SDK (3.0), ZyLAB Toolkit (1.0)
Database Monitoring Capability	Microsoft Windows SDK (3.0), Microsoft C Compiler (5.1)

Archiving Capability   Microsoft C Compiler (5.1),
                                      Microsoft Windows SDK (3.0),
                                      ZyLAB Toolkit (1.0)

3.2 Portability

The issue of portability only applies to the CAB Toolkit segment.
Currently DTIC plans to present the CAB on Diskette product solely
as a Microsoft Windows 3.0 application. As such, portability is
not an issue. However, development will be accomplished using the
Microsoft C Language Compiler, version 5.1 an ANSI standard C
compiler in conjunction with the Extensible Virtual Toolkit (XVT),
a COTS product developed and distributed by API Ltd. XVT provides
application portability among various graphical windowing systems
by abstracting the objects (windows, buttons, events and commands,
etc.) that programmers require when developing applications in a
windows environment.

Should DTIC decide to migrate the CAB on Diskette system to either
a UNIX or Macintosh platform, the use of XVT will increase the
potential for producing portable code. The National Institute for
Standards and Technology (NIST) released a draft version of the
Applications Portability Profile (APP) on November 15, 1990. The
APP is a checklist of specifications federal agencies can use to
decide which products to require in open-systems procurements. The
NIST recommended the use of XVT as the standard tool for developing
a user interface that maps an application to a windowing system.

ZyLAB has developed the Windows 3.0 version of their product using
XVT, however, they found it necessary to write a portion of the
code using native Windows 3.0 functions. This factor must be taken
into account when developing CAB applications. There is a
possibility that 100% portability can not be guaranteed.
Portability will be maintained to the greatest extent possible
without sacrificing overall product quality.

3.3 Flexibility

The CAB on Diskette software development effort will adhere to the
modular concept of structured design. This will ensure a
maintainable and adaptable library of code on which the CAB on
Diskette system can evolve. Modules will be decomposed such that
functions are developed and implemented in manageable logical
blocks.

To ensure that code remains flexible and maintainable each prototype module will be documented as to purpose, inputs, outputs, and processing steps. This process will produce a well documented prototype from which to develop the initial CAB on Diskette system.

3.4 CAB on Diskette User System Hardware Software Requirements

Initially, the CAB on Diskette system was designed to run as a DOS product. Prior development efforts were geared toward installing the system on Zenith 248 systems which the user survey indicated many CAB users had purchased. The Zenith 248 microcomputer is an 80286 based system configured with 640K RAM, a 5 1/4 inch floppy disk drive and a 20 MB hard disk drive.

The decision to develop the product as a Windows 3.0 application, required significant hardware and software upgrades. The proposed CAB on Diskette system is designed to be implemented on a system configured with following minimum hardware and software requirements:

a. the microcomputer must be an 80286 based system;

b. the system must be configured with 1 megabyte of RAM, but, preferably two (2). (ZyINDEX recommends that their product run in an environment with at least 2 megabytes of RAM);

c. the system must be configured with a 40 megabyte hard disk drive. This is necessary to accommodate the increased storage requirements of the Windows 3.0 Operating Environment;

d. the system must be configured with Microsoft Windows 3.0. (Previous versions of Windows will not be compatible with either ZyINDEX or supplementary CAB on Diskette software components);

e. though a mouse is not essential, it significantly eases the effort in negotiating the Windows 3.0 system and component applications. (Microsoft includes a mouse and the appropriate driver software as part of the Windows 3.0 product); and,

f. The system must be capable of running the Windows 3.0 version of ZyINDEX. All previous versions of ZyINDEX are incompatible with the Windows 3.0 Operating Environment.

APPENDICES

APPENDIX A

Compilation of Responses to
Informal Interview of CAB Users

In the intervening two years since the initial user survey was conducted, DTIC requested that those functional requirements derived from the survey be validated with respect to current CAB user requirements. DTIC also sought a more complete understanding of the current configuration of the systems throughout the user community to determine whether additional hardware/software capabilities were required to support the revised CAB product. Further, DTIC required a more complete understanding of the database management requirements as they related to the existing software suite capabilities.

To this end DTIC conducted an informal survey involving a cross-section of CAB users. The dissemination and subsequent return of the questionnaire was performed on a voluntary basis with a representative sample of 50 users. The results of this survey are based upon those users that responded within the time frame of the project. Unfortunately, as of the date of this document, none of those to whom the document was distributed have responded.

CAB ON DISKETTE QUESTIONNAIRE

The Defense Technical Information Center (DTIC) is preparing to issue their Current Awareness Bibliography (CAB) on Diskette. The information that each CAB user receives will be developed from the same profile used in compiling the current hard copy version of CAB. In addition to the electronic availability of the CAB product, DTIC is developing a software tool to be distributed with the CAB on Diskette which will facilitate the development and maintenance of a personalized bibliographic database. The product is being targeted to run on a PC configured with at least 1 Megabyte of memory, a low density floppy disk drive and a 40 Megabyte hard disk drive.

The major components of this software tool are a powerful document indexing capability and a full text search engine supporting free-text, keyword, proximity, range and Boolean search techniques. In addition, a gateway capability which will allow access to the DoD Gateway Information System (DGIS) and, from there, access to many other on-line bibliographic services, a translation facility which will convert information accessed from the DGIS into a standard format to be loaded into the personalized CAB database. And, finally, a means for modifying your profile and forwarding it to DTIC electronically.

The product will be distributed as a Microsoft Windows 3.0 application thus requiring users to configure their PC systems with Microsoft Windows 3.0. With the trend in software development leaning heavily toward implementing software packages as windows applications, DTIC decided to redirect the development of it's CAB on Diskette product within this environment in order to capitalize on existing indexing and text search tools already developed as Windows applications. This, in turn, will present the user with a consistent look and feel across applications when interacting with the CAB on Diskette toolset.

In June of 1988 DTIC distributed a survey to then current CAB users which compiled information on existing hardware/software configurations, familiarity with databases,and the use of the CAB information itself.   Since then, in response to technological advancements and emerging industry standards regarding the user interface and software product development, the CAB on Diskette product requirements have evolved . For this reason DTIC felt it necessary to distribute a new survey in order to reassess CAB user needs and possible changes in hardware/software configuration to CAB users systems.

The following pages present questions pertinent to the CAB on Diskette implementation.

Please record your responses on the sheets provided.

1. Briefly explain how you utilize the information distributed
   on CAB?

   _____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

2. What other DTIC information services do you use? Explain,
   if applicable, how the various DTIC information systems
   relate to you and your job or your use of the information
   distributed on the CAB?

   _____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

3. Do you accumulate CABs over a period of time? Yes __ No __

    If so, how long? 1-3 Mos. __
                     3-6 Mos. __
                     1 Year   __
         More than 1 Year __

4. Are all bibliographic citations contained in a bi-weekly
    release of the CAB relevant to you? That is, do you discard
    a portion of the citations that you receive? Yes __ No __

5. Does your current CAB profile accurately reflect your
    information requirements? Or, would you better served with
    a capability to modify your profile to suit your current
    situation? Yes __ No __

6. How often do you need to modify your profile?

        Never   __
        Yearly   __
        Twice a Year   __
        Other   _____

7. What type of computer(s) would you use for the CAB
    database?

    PC XT   __
    PC AT   __
    IBM Compatible   __
    Other   _____

8. What capacity hard disk drive does your computer have?

    20 Mb   __
    40 Mb   __
    80 Mb   __
    Other _____

9. How much RAM memory does your computer have?

    640 K   __
    1 Mb   __
    2 Mb   __
    4 Mb   __
    Other _____

10. Does you personal computer system have a mouse? Yes __
    No __

11. Do you run Microsoft Windows version 3.0 on you PC? Yes __
    No __

12. Which Microprocessor does your PC have?

    80286   __
    80386   __
    Other _____

13. Would you find it useful to incorporate
    bibliographic information from additional on-line
    sources with your CAB data, thus developing and
    maintaining a personalized bibliographic
    database? Yes __ No __

    What sources would be most useful?

    _____

    _____

    _____

    _____

    _____

    If you currently access any of the above listed
    sources, in what format is the information
    retrieved (check applicable options)?

        electronic ASCII   __
        downloaded via a bulletin board __
        hardcopy   __
        wordprocessing files   __

14. Would it be helpful, while reviewing a CAB, to
    order, on-line the Technical Report to which the
    CAB abstract refers? Yes __ No __

15. Are you a direct user of CAB data? Yes __ No __

16. Do you have a need to incorporate bibliographic
    information into other documents? Yes __ No __

Please forward any additional questions or comments
that you may have when completing this questionnaire to
Jeffrey M. Havel (703) 620 8120 or (703) 274 7661.

APPENDIX B

Mainframe Subsystem Processing Flow Diagram

This Appendix presents a diagram that graphically depicts the flow of CAB data through the Mainframe subsystem from extraction from the TR Database to the creation of an input file properly formatted for processing by the RIMAGE Diskette Duplicating System. Following is a brief narrative explaining the CAB on Diskette Mainframe Subsystem processing steps.

CCA90R   This module searches the TR Database extracting citations based Search Control Number (SCN).

CCA36A   This module sorts the citations in accession number sequence within an SCN.

CCA40R   This module writes those CABs that are flagged for RIMAGE processing. Output is directed to output file CCA40RD on a mass storage device.

EDD26X   This module creates two output files; EDD26XA and EDD26XB. EDD26XA contains the CAB citations. EDD26XB contains header information for each SCN. The module reads the CAB data stored in the output file CCA40RD and separates the header information for each SCN from the ensuing citations. As the module processes the citations within each SCN, it accumulates a count of the number of bytes contained in the SCN and the number of citations extracted under an SCN.

EDD31C   This module receives input from two files; EDD26XA and EDD26XB. The module merges the header information and counts stored in the EDD26XB input file with the CAB citations from input file EDD26XA. The merging is done by SCN number. Output is directed to output file EDD31CA.

EDD32P   This module receives input from EDD31CA of CAB on Diskette data that is yet unformatted for input to the RIMAGE Disk Duplicating System. The module formats the CAB data for processing by the RIMAGE system. Output is directed to the output file EDD32PA.
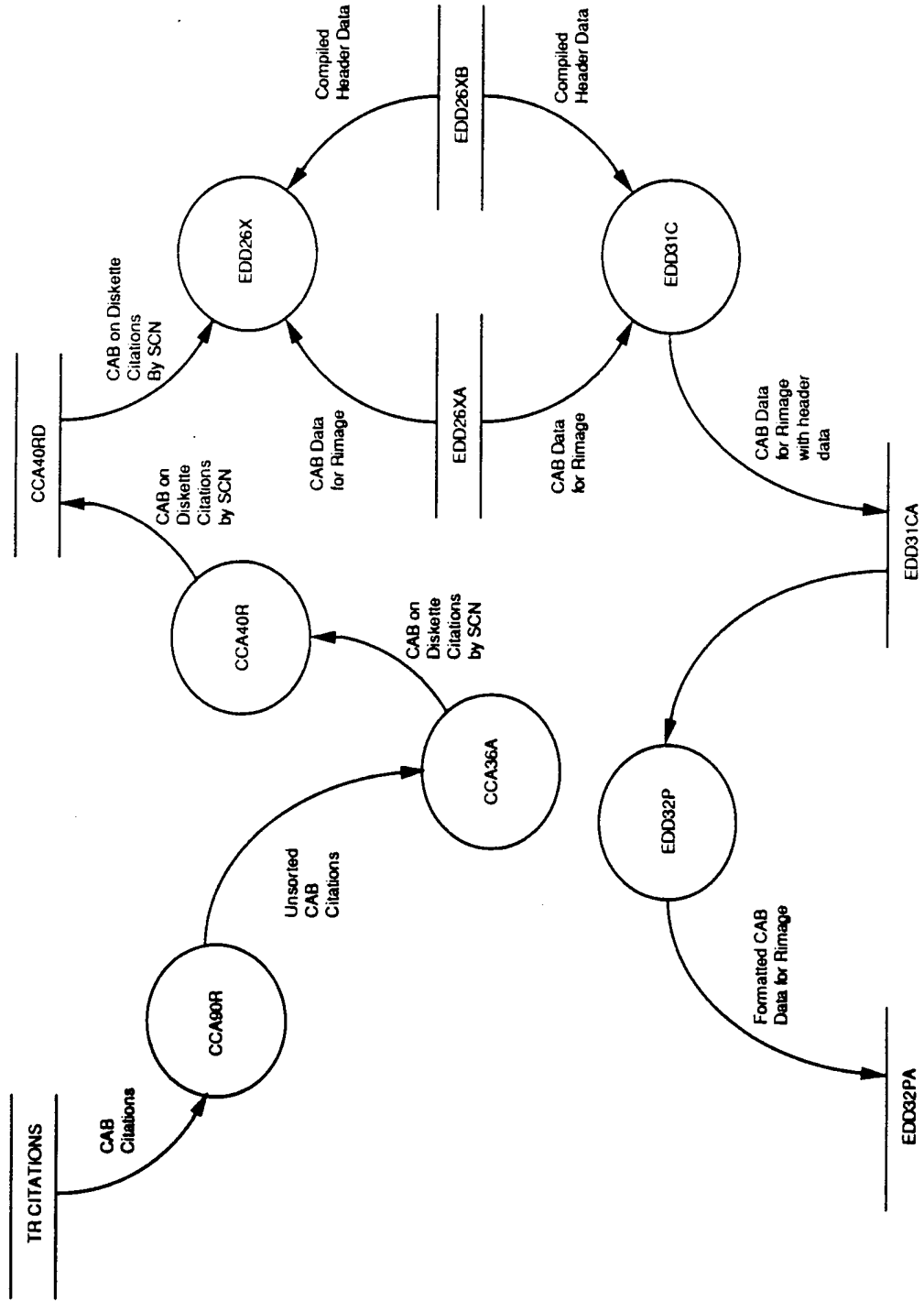
CAB ON DISKETTE
MAINFRAME SUBSYSTEM DATA FLOW

APPENDIX C

Field Identifiers for CAB Fields

The following table presents the current numeric field identifiers for CAB citations in the left hand column and the proposed alphneumeric identifiers in the right hand column.

The proposed field identifiers are enclosed within angle brackets. This delimiter was selected as it is the current convention for "tagging" and fielding textual information for electronic storage and processing as described in MIL-STD-28001. This approach to "tagging" text data is known as SGML or Standard Generalized Markup Language.

Though angle brackets are not specifically called for in MIL-STD-28001, nearly all implementations utilize this convention. The angle brackets provide a method for defining document structure and delimiting field identifiers from the contents of the document. By employing the SGML tagging convention, the process of presenting textual information on a variety of output media is greatly facilitated.

Numeric Identifier	Text Identifier	CAB Text
˜1˜	<acc_num>	Accession Number
˜2˜	<flds_grps>	Fields and Groups
˜3˜	<classification>	Classification
˜4˜		
˜5˜	<corp_author>	Corporate Author(source Name):
˜6˜	<title>	Title:
˜7˜	<classified_title>	Classified Title
˜8˜	<title_class>	Title Classification:
˜9˜	<descr_note>	Descriptive Note:
˜10˜	<pers_author>	Personal Author:
˜11˜	<report_date>	Report Date:
˜12˜	<pagination>	Pagination:
˜13˜		
˜14˜	<src_series_num>	Source Series Number:
˜15˜	<contract_num>	Contract Number:
˜16˜	<project_num>	Project Number:
˜17˜	<task_num>	Task Number:
˜18˜	<monitor_rpt_num>	Monitor Report Number:
˜19˜		
˜20˜	<rpt_class>	Report Classification:
˜21˜	<supp_note>	Supplementary Note:
˜22˜	<dist_avail>	Distribution Availability:
˜23˜	<descriptor_class>	Posting Terms (Descriptors):
˜24˜	<descriptors>	Descriptors Classification:
˜25˜	<post_term>	Posting Terms(Identifiers):
˜26˜	<id_class>	Identifiers Classification:
˜27˜		Abstract:
˜28˜	<abstract_class>	Abstract Classification:
˜29˜		
˜30˜	<annotation>	Annotation:
˜31˜		
˜32˜		
˜33˜	<dist_codes>	Distribution Availability
˜34˜	<serial_code>	Serial Code:
˜35˜	<corp_athr_code>	Corporate Author Code:
˜36˜	<doc_location>	Document Location:
˜37˜	<cl>	CL:
˜38˜	<dc>	DC:
˜39˜		
˜40˜		
˜41˜		
˜42˜		
˜43˜		
˜44˜		
˜45˜		
˜46˜		
˜47˜		
˜48˜	<sbir>	SBIR Holding Symbol:
˜49˜		

APPENDIX D

CAB on Diskette
Software Change Requests
DTIC Forms 372

This Appendix contains required DTIC Forms 372 for initiating requests for data systems software support. The form is the vehicle through which DTIC specifies enhancements to existing software or requests development of additional software.

The following forms specify the required modifications to the UNISYS Assembler modules EDD26X and EDD31C and the UNISYS COBOL module EDD32P.

REQUEST FOR DATA SYSTEMS SOFTWARE SUPPORT	DTIC-R CONTROL NO. A.	DTIC-Z TASK NO. B.

PART I - ORIGINATOR'S SUBMISSION

1. ORGINATOR'S NAME	2. OFFICE SYMBOL	3. PHONE	4. DATE OF REQUEST
Carol Jacobson	DTIC-EA	x47661	

5. TITLE OF REQUEST

Current Awareness Bibliography (CAB) on Diskette Modify Medium Indicator

6. DESCRIPTION OF REQUEST (STATE TYPE OF PRODUCT OR SERVICE)

System Change Request (SCR) :

The following modifications are to be applied to module EDD31C:

1) Add an indicator to the profile header to indicate on which medium the CAB is to be produced. The indicator will be a 1 byte flag that can have 1 of 3 values. A zero indicates the CAB is to be produced on hardcopy medium. A one indicates the data is to be prepared for diskette. A two indicates the data is to be prepared for both output media.

7. PROJECT NUMBER (ATTACH COPY)	8. SCC CODE	9. DESIRED DELIVERY DATE
733 13 3220	733 13 3200	

10. JUSTIFICATION (STATE THE CURRENT SITUATION AND THE ANTICIPATED SAVINGS/BENEFITS.)

Medium indicators will be added to the profile headers to indicate each user's choice in output media. The CAB special programs must read these indicators and route particular CABs through the procedures necessary for output on the requested media. The benefits to be gained from this change vary with the processing point at which the medium indicator is read. The medium indicators should be read with CAB processing split according to medium at the point least likely to cause redundancy.

11. PSE SIGNATURE	12. DATE

PART II - DTIC-R REVIEW

1. RECOMMENDATION	2. REMARKS	3. DATE FORWARDED TO DTIC-Z
☐ ACCEPT ☐ REJECT ☐ DEFER UNTIL _____		4. ANALYST'S INITIALS

DTIC FORM MAR 86 372

REQUEST FOR DATA SYSTEMS SOFTWARE SUPPORT	DTIC-R CONTROL NO. A.	DTIC-Z TASK NO. B.

PART I - ORIGINATOR'S SUBMISSION

1. ORGINATOR'S NAME	2. OFFICE SYMBOL	3. PHONE	4. DATE OF REQUEST
Carol Jacobson	DTIC-EA	x47661	

5. TITLE OF REQUEST

Current Awareness Bibliography (CAB) on Diskette Modify CAB Field Identifiers

6. DESCRIPTION OF REQUEST (STATE TYPE OF PRODUCT OR SERVICE)

System Change Request (SCR):
The following modifications are to be applied to module EDD26X:

1) Provide field identifiers within individual citations to reflect field names as distributed with the printed product. See Attached.

2) Append an end of citation identifier to each citation.

3) Enhance the header information to include the following:
  A) Search control number;
  B) Diskette creation date;
  C) Number of citations included on the diskette (the number of citations extracted per profile;file size to reflect the total number of bytes of CAB data on the diskette.)

7. PROJECT NUMBER (ATTACH COPY)	8. SCC CODE	9. DESIRED DELIVERY DATE
733 13 3220	733 13 3200	

10. JUSTIFICATION (STATE THE CURRENT SITUATION AND THE ANTICIPATED SAVINGS/BENEFITS.)

The module EDD26X is the logical module to build CAB citations. It requires modifications to existing code and not the development of a new software module that would perform a largely duplicative task. Item 1 above requires replacing one identifier with another. The module already knows when an end of citation occurs. It must write out an additional string, as requested in item 2. The information requested in item 3 is already being compiled. The module need only write it out. The benefit is derived from the fact that additional software is not required to perform the same task twice. The modifications will also provide additional ease in pc processing.

11. PSE SIGNATURE	12. DATE

PART II - DTIC-R REVIEW

1. RECOMMENDATION	2. REMARKS	3. DATE FORWARDED TO DTIC-Z
☐ ACCEPT		
☐ REJECT		4. ANALYST'S INITIALS
☐ DEFER UNTIL _____		

DTIC FORM 372
MAR 86

REQUEST FOR DATA SYSTEMS SOFTWARE SUPPORT	DTIC-R CONTROL NO. A.	DTIC-Z TASK NO. B.

PART I - ORIGINATOR'S SUBMISSION

1. ORGINATOR'S NAME Carol Jacobson	2. OFFICE SYMBOL DTIC-EA	3. PHONE x47661	4. DATE OF REQUEST

5. TITLE OF REQUEST

Current Awareness Bibliography (CAB) on Diskette Modify Header Information

6. DESCRIPTION OF REQUEST (STATE TYPE OF PRODUCT OR SERVICE)

System Change Request (SCR):
The modifications are to be applied to Module EDD32P:

1) Provide field identifiers within individual citations to reflect field names as distributed with the printed product. See Attached.

2) Append an end of citation identifier to each citation.

3) Enhance the header information to include the following:

    A) Search control number;
    B) Diskette creation date;
    C) Number of citations included on the diskette;(the number of citations extracted per profile; file size to reflect the total number of bytes of CAB data on the diskette).

7. PROJECT NUMBER (ATTACH COPY) 733 13 3220	8. SCC CODE 733 13 3200	9. DESIRED DELIVERY DATE

10. JUSTIFICATION (STATE THE CURRENT SITUATION AND THE ANTICIPATED SAVINGS/BENEFITS.)

This module is responsible for feeding the CAB DATA to the Rimage System. As such, it must accommodate the changes applied to modules EDD26X and EDD31C. The benefit derived from this is CAB data that is formatted correctly for inclusion in User Databases at the time the data is created.

11. PSE SIGNATURE	12. DATE

PART II - DTIC-R REVIEW

1. RECOMMENDATION	2. REMARKS	3. DATE FORWARDED TO DTIC-Z
☐ ACCEPT ☐ REJECT ☐ DEFER UNTIL _____		4. ANALYST'S INITIALS

DTIC FORM MAR 88 372
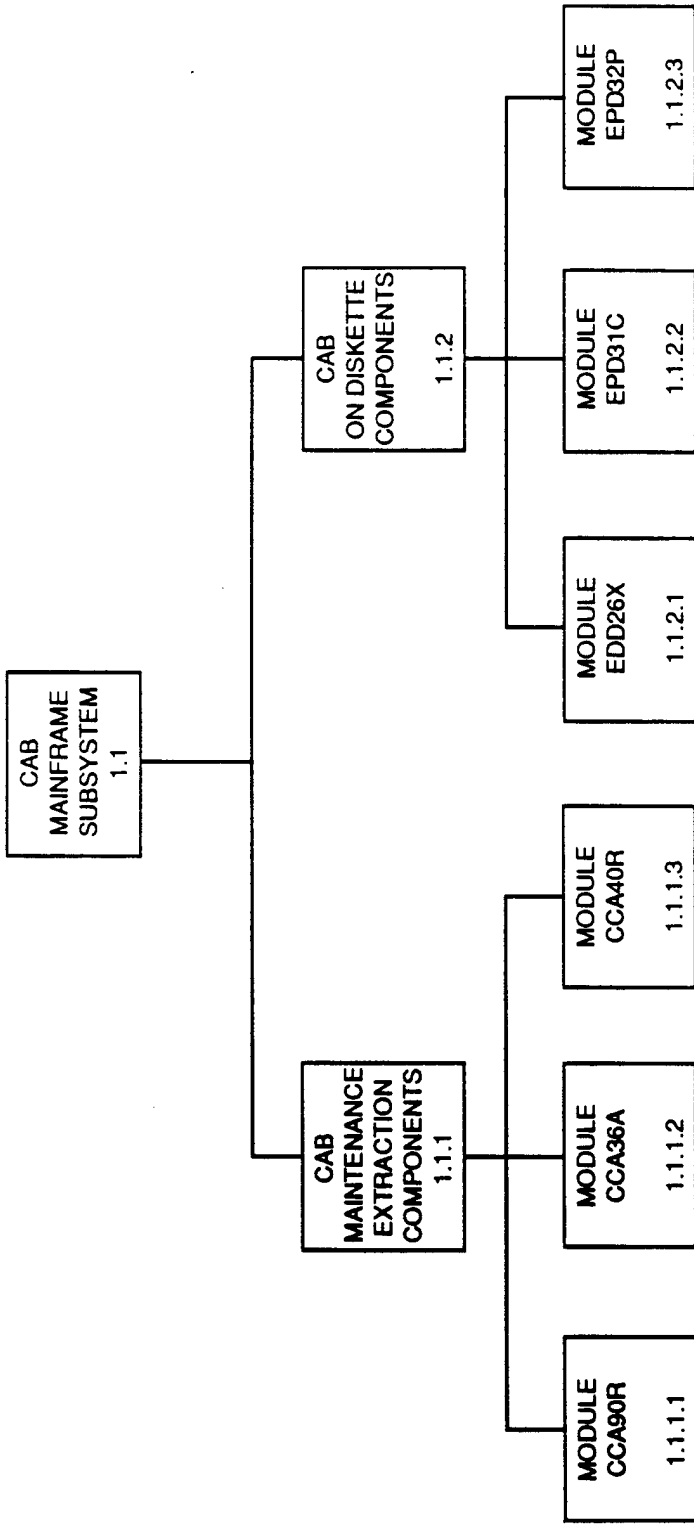
APPENDIX E

CAB on Diskette
System Segment
Architecture

This Appendix contains structure charts that define the segmented architecture of the CAB on Diskette System. The first structure chart defines the three segments of the system architecture; Mainframe Subsystem; CAB Toolset Subsystem; CAB COTS Product Subsystem. The succeeding diagrams define the functional breakdown by subsystem and component modules.

The structure chart that addresses the CAB Toolset Subsystem presents both the prototype system configuration and the initial release configuration. The initial release of the CAB on Diskette system is comprised of the prototype modules and those modules defined beneath the initial release node of the CAB Toolset Subsystem structure chart.
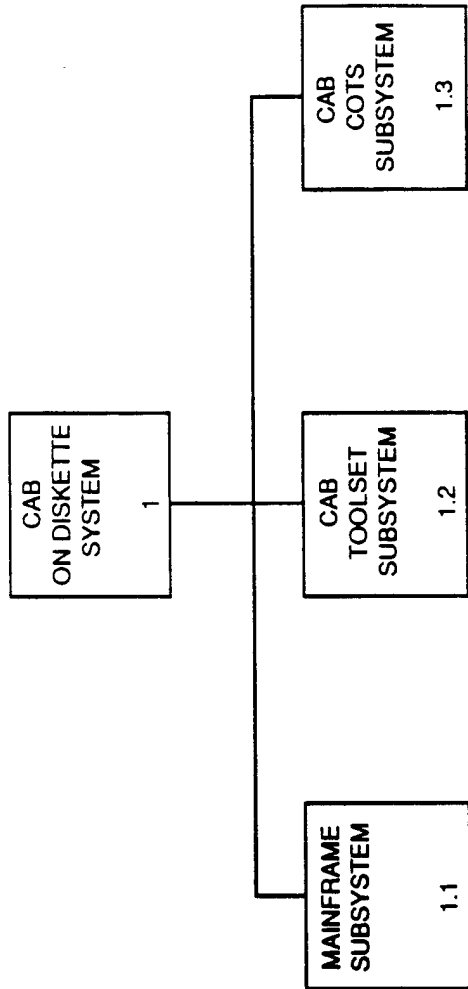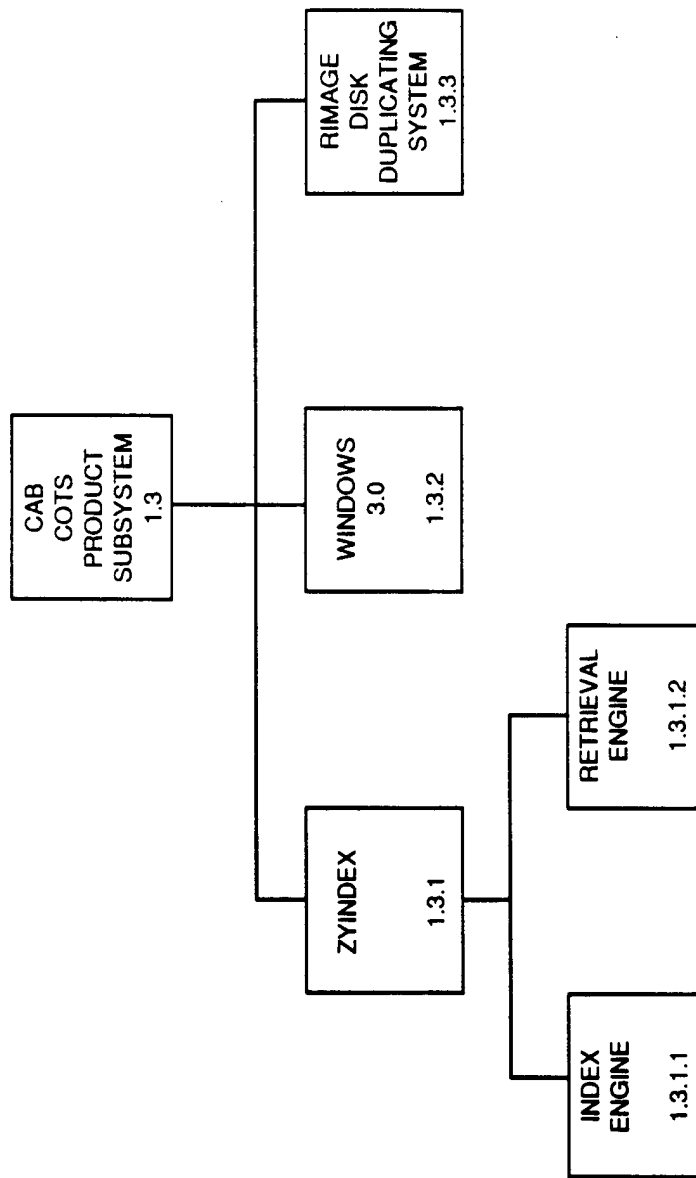
CAB ON DISKETTE
TOP LEVEL SYSTEM SEGMENT ARCHITECTURE

CAB ON DISKETTE(M)11-429A/LG05C/RJ/11-29-90

CAB ON DISKETTE
MAINFRAME SUBSYSTEM ARCHITECTURE

```
                    CAB
                  MAINFRAME
                  SUBSYSTEM
                     1.1
                      |
        +-------------+-------------+
        |                           |
       CAB                         CAB
    MAINTENANCE                ON DISKETTE
    EXTRACTION                 COMPONENTS
    COMPONENTS                     1.1.2
      1.1.1                          |
        |                  +---------+---------+
  +-----+-----+            |         |         |
  |     |     |          MODULE    MODULE    MODULE
MODULE MODULE MODULE    EDD26X    EPD31C    EPD32P
CCA90R CCA36A CCA40R
                        1.1.2.1   1.1.2.2   1.1.2.3
1.1.1.1 1.1.1.2 1.1.1.3
```
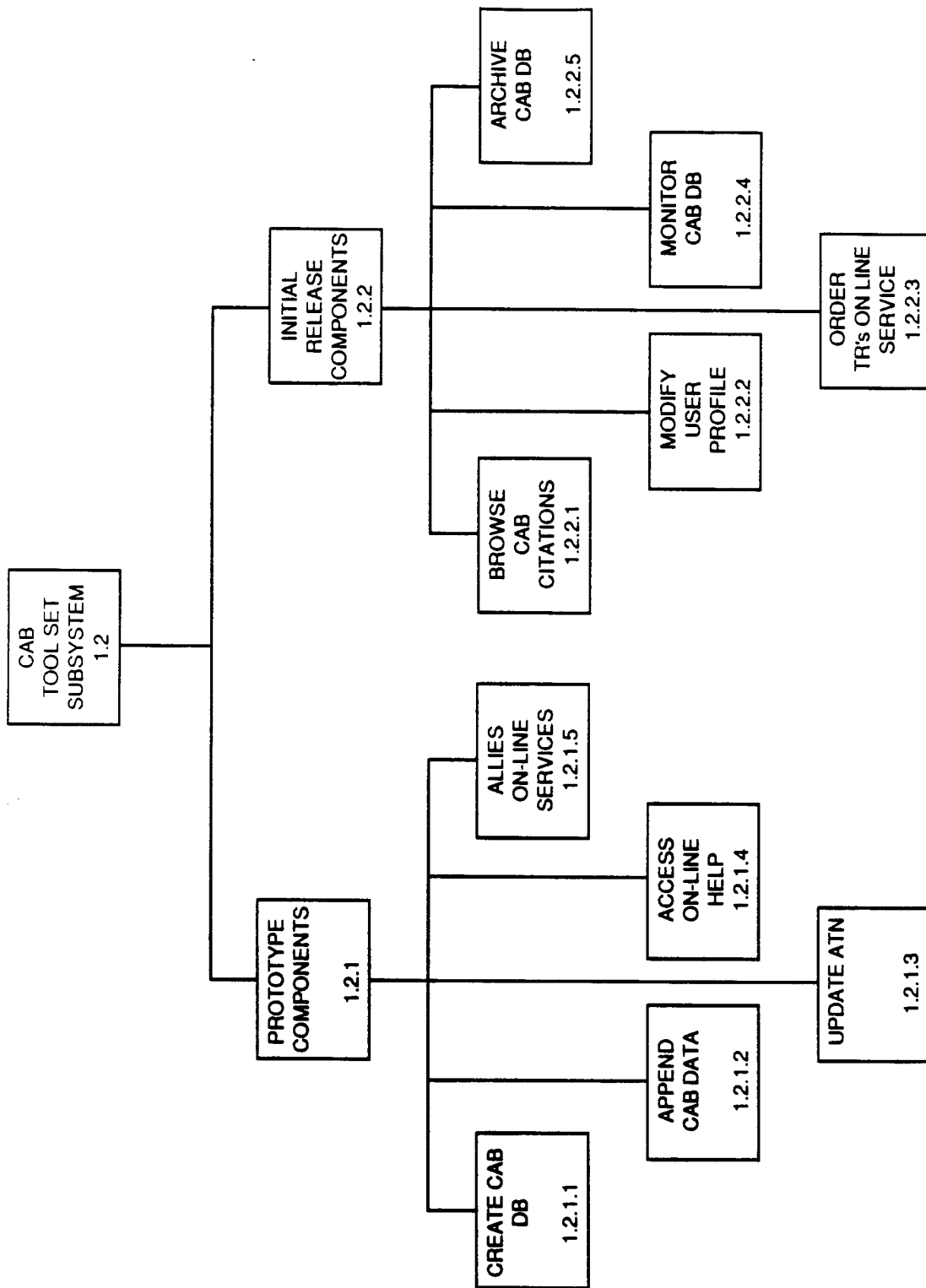
CAB ON DISKETTE
CAB TOOL SET SUBSYSTEM ARCHITECTURE

CAB ON DISKETTE(M)A/11-429/LG02C/RJ/11-29-90

CAB ON DISKETTE
COTS PRODUCT SUBSYSTEM ARCHITECTURE